S/TSIU Doc. 57

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ENVIRONMENT DEPARTMENT

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CERTIFIED MAIL – RETURN RECEIPT REQUESTED

668233

January 14, 2008

Mr. Timothy E. Eastep, Manager
Environment, Land & Water Department
Chino Mines Company
P.O. Box 7
Hurley, New Mexico 88043

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REMEDIAL BRANCH
(6SF-RP)

RE: Comments on the Amendment Study Work Plan dated July 26, 2007
Smelter/Tailing Soils Investigation Unit (S/TSIU)
Chino Administrative Order on Consent (AOC)

Dear Mr. Eastep:

The Ground Water Quality Bureau of the New Mexico Environment Department (NMED) received the revised Amendment Study Work Plan on August 7, 2007. The NMED has completed a review of the Work Plan and provides the following comments in order to complete a final Work Plan. The NMED requires a response to comments within fifteen (15) days of receipt of this letter as per the AOC, Section IX, F.

General Comments

1. Although NMED supports implementation of the Amendment Study to improve understanding site specific soil characteristics that may stabilize metals, any short term results may not be useful for remedial decisions when the Feasibility Study is submitted. However, continued efforts may indicate usefulness as the Remedial Design and Remedial Action Plan progress.

2. This study provides an excellent opportunity to test the Site-wide ERA conclusions for vegetation endpoints based on pCu^{2+} measurements in soils. While the Site-wide ERA demonstrated a very reliable model for predicting pCu^{2+} from soil pH, organic matter and total copper concentrations ($r^2>0.9$), the analysis of the soils in each study area for pCu^{2+} concentrations could help refine the soil pCu^{2+} prediction model. It is suggested that the soils from each study area be analyzed using the ion-selective probe technique used in the

Ecological RI (Arcadis, 2001) both prior to the study plot construction and semi-annually. This will help determine the effectiveness of the Amendment Study at reducing the amount of bioavailable copper in soils and further calibrate the pCu^{2+} prediction model.

3. Copper concentrations are above those that may potentially cause risk to wildlife populations in the area; it is important to monitor the effects of the proposed soil amendments on the food sources of the species that, if the amendments are successful, are expected to inhabit the improved area at a higher density. Samples of vegetation (forage and seed, if available) should be collected initially to provide a baseline and annually through the five year monitoring period.

Specific Comments

1. Section 1.1, Site Description and Background, page 1-1: the second paragraph lists two (2) citations (Chino, 1995) and (SRK, 2005) which are not listed in the Reference Section. Please add to reference list.

2. Section 1.2, Project Description, page 1-3: please delete the sentence at the top of the page reading "If successful, the pilot study will be incorporated into the Feasibility Study (FS)."

3. Section 1.2, Project Description, page 1-3: please revise the last two paragraphs to refer to Sections 4.1 and 4.2 rather than Sections 2.1 and 2.2.

4. Section 1.2, Project Description, page 1-3: the last paragraph describing the four study plots does not match Figure 1; NE and E of Hurley designated A and B do not match.

5. Section 2.0, Remedial Technology Description, page 2-1: second paragraph, please add the citation (Schnitzer and Kodama, 1977) to the Reference Section.

6. Section 3.0, Test Objectives, page 3-1: please revise the fourth bullet, in the set of six bullets, to read "sample the amended soils semi-annually after amendment to ensure that the target pH has been attained and sustained."

7. Section 3.0, Test Objectives, page 3-1: please revise the second bullet, in the set of four bullets, to read "Sustained pH levels within the target range of 6.0 to 6.5."

8. Section 3.0, Test Objectives, page 3-1: please revise the first two sentences of the fourth bullet, in the set of four bullets, to read "Improved soil chemistry (e.g., C/N ratio and concentration of nutrients) is sustained through the five year monitoring period. C/N ratio stability will provide a measure of longevity of the OM addition within the target mixing zone of 8-inches bgs."

9. Section 4.1, Copper Concentration and pH, page 4-1: the first paragraph lists the citation (Phelps Dodge Corporation, 2005) which is not listed in the Reference Section. Please add to the Reference Section.

10. Section 4.1, Copper Concentration and pH, page 4-1: please revise the second paragraph to begin "A soil concentration of 2,700 ppm copper was derived by Chino to protect of the small ground feeding bird population. The NMED has not approved this number as the final remediation goal protective of the small ground feeding bird."

11. Section 4.1, Copper Concentration and pH, page 4-1: the second paragraph lists the citation (NewFields, 2006) which is not listed in the Reference Section. Please add to the Reference Section.

12. Section 4.2, Rangeland Condition, page 4-1: the first paragraph lists the citations (Arcadis JSA, 2001) and (Woodward-Clyde, 1997) which are not listed in the Reference Section. Please add to the Reference Section.

13. Section 4.3, Amendment, page 4-2: please revise the second sentence of the first bullet to read "BBL will evaluate soil texture further as part of the Pre-Amendment Sampling of Section 6.2."

14. Section 4.3, Amendment, page 4-2: please revise the first sentence of the second paragraph to read "Lime will *be* applied ..."

15. Section 4.3, Amendment, page 4-3: the last sentence states "Thus, compared with similar sites these application rates are reasonable." However, only one other site is mentioned for comparison and without a reference to the location of such information. Please add a reference and some further details for comparison.

16. Section 4.4, Organic Matter Amendment, page 4-4: the last paragraph states "OM will be applied following lime application in each of the four amendment study areas." However, this statement does not agree with the Table on Page 5-1. Please revise.

17. Section 4.4, Organic Matter Amendment, page 4-4: please specify, in the last paragraph, what type of manure will be used as the OM amendment and include that an analysis for nitrogen and pH will be conducted prior to placement of that amendment.

18. Section 4.4, Organic Matter Amendment, page 4-4: the last sentence incorrectly refers to Section 3.0, please revise.

19. Section 4.5, Revegetation, page 4-5: the last sentence states "achieve ample seed germination". Please clarify "ample" and provide a schedule for seeding versus natural revegetation with a set of decision criteria to indicate when seeding is necessary. Also note that the CCP decision criteria shall be used to monitor vegetation success.

20. Section 4.5, Revegetation, page 4-5: please add a description pertaining to dust control prior to successful revegetation.

21. Section 4.5.1, Seed Selection, page 4-5: please include the appropriate (north/south area) seed mix list from the CCP.

22. Section 5.1, Control, page 5-1: this Section states "one control area will be utilized". Due to the poor range condition of this area "near East A" this control area will not reflect success in the other three study areas. Chino shall include four control plots, one for each amendment plot. Ideally, plots for each treatment should be included at each site location due to the varying soil and contaminant conditions.

23. Section 5.1, Control, page 5-1: this Section states "The control plot will be tilled". Tilling is a treatment by itself and can not be directly compared to the spray or spray and till treatments.

24. Section 5.1, Control, page 5-1: delete the last sentence of this Section; it infers that the control and reference areas are the same. Also, Section 6.1 does not mention control areas.

25. Section 5.2, Erosion Control and BMP: please provide a discussion of how the placement of fabric rolls may effect revegetation which may not be related to the amendments.

26. Section 6.1, Measures of Regrowth Success and Reference Sites, page 6-1: the first paragraph discusses a survey of "total plant percent cover". Revise this Section to follow the Closure/Closeout Plan, Section 4.3, Site-specific Revegetation Success Guidelines.

27. Section 6.1, Measures of Regrowth Success and Reference Sites, page 6-1: first paragraph, second sentence, please add that reference areas shall be selected with concurrence from NMED.

28. Section 6.1, Measures of Regrowth Success and Reference Sites, page 6-1: the last paragraph states "Percent cover of native species between 70 and 100% of the baseline observed at the reference sites will be considered a successful regrowth during the first two years following implementation. In order to consider this as a final remedy, success shall be based on the entire 5 year study. Please revise to reflect change.

29. Section 6.1, Pre-Amendment Sampling, page 6-1: BBL proposes to sample a minimum of 2 locations per ¼ acre plot. Please revise this section to include additional sampling will be conducted until a sufficient number of samples are collected to represent conditions of each plot.

30. Section 6.4, Sampling and Analysis, page 6-2: please revise the first sentence to read "Post-amendment sampling will be conducted semi-annually following Amendment Study implementation."

31. Section 6.4, Sampling and Analysis, page 6-2: please add potassium to the analyte list in the fourth sentence.

32. Section 6.5, Best Management Practices Inspection, page 6-2: the first sentence does not agree with Table 6-1 on page 6-3. Please revise as necessary.

33. Section 6.6, Long-Term Monitoring, page 6-3: please revise the first sentence to read "Long-term monitoring inspections will be conducted semi-annually ~~eighteen months~~ through five years."

34. Section 6.6, Long-Term Monitoring, page 6-3: please revise the third sentence to reference the Closure/Closeout Plan, Section 4.3, Site-specific Revegetation Success Guidelines.

35. Section 7.0, Analytical Methods, page 7-1: the Table does not include total organic carbon as listed in Section 6.2. Please revise.

36. Section 7.0, Analytical Methods, page 7-1: please use the SPLP extraction techniques used in the collection of the ERI/ERA data. The ERA leaching method was altered to simulate conditions in wetted soils. Three main adjustments were made: 1) the soil to solution ratio was reduced to better simulate soils wetted by rainfall. A ratio of 1:5 soil:solution was ultimately used in the ERA based on the empirically determined minimum solution needed to extract an adequate volume for chemical analysis; 2) 0.01 M $CaCl_2$ was used instead of deionized water to better simulate the ionic strength of soil solutions (after Sauve et al. 1995); and 3) initial pH of the soil solution was not adjusted to 5, as is commonly done in the standard Method 1312 implementation. This step was taken to help ensure that the pH of the soil solution was due to the elements of the solution, not an outside source of acid.

37. Section 8.0, Data Quality, Management and Interpretation, page 8-1: please revise the second bullet in the set of four to read "Sustained pH levels within the target range of 5. to 6.5;"

38. Section 8.0, Data Quality, Management and Interpretation, page 8-1: please revise the third sentence of the third bullet in the set of four to read "Composition or speciation ~~will not~~ *may* be used as a metric ~~as~~ *although* several years may be necessary to develop plant diversity during ~~natural~~ revegetation; and"

39. Section 8.0, Data Quality, Management and Interpretation, page 8-1: please revise the first sentence of the last bullet to read "Changes in soil … sustained over ~~18 month~~ *the 5 year* monitoring period."

40. Section 8.0, Data Quality, Management and Interpretation, page 8-1: please revise the second sentence of the last bullet to read "C/N ratio stability ~~over 18 months~~ will provide … zone of 8-inches bgs."

41. Section 8.0, Data Quality, Management and Interpretation, page 8-2: revise the last paragraph as per General Comment 1.

42. Section 12.0, References, page 12-1: please revise this Section. Some references were not cited in the text and some citations are not listed in the Reference list.

If you have any questions you may contact me at 388-1934.

Sincerely,

Phil Harrigan

Phil Harrigan, Chino AOC Project Manager
Mining Environmental Compliance Section
Ground Water Quality Bureau
New Mexico Environment Department
Silver City Field Office

cc: Mary Ann Menetrey, NMED
Jerry Schoeppner, NMED
Mark Purcell, USEPA